CLAIMS

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1. An image pickup apparatus comprising:

an array of unit cells arranged in rows and columns, each unit cell having a light-receiving device for receiving light and generating an electric charge corresponding to the light, a charge-accumulating section for accumulating the electric charge generated by the light-receiving device, a transfer device for transferring the electric charge from the light-receiving device to the charge-accumulating section, and a charge-limiting device for limiting the electric charge accumulated in the charge-accumulating section;

a plurality of vertical signal lines extending along the columns of unit cells, respectively, each for receiving a electric data item corresponding to the electric charge accumulated in the charge-accumulating section of any unit cell of the associated column; and

a control circuit for controlling each of the unit cells, causing the charge-limiting device to limit the charge generated by the light-receiving device during a first period and transferred to the charge-accumulating section through the transfer device and, adding, to the electric charge accumulated in the charge-accumulating section, the charge generated by the light-receiving device during a second period following the first period and transferred to the charge-accumulating section through the transfer device.

2. An image pickup apparatus according to claim 1, wherein the control circuit controls each of the unit cells of the same row such that the charge-limiting device limits the charge accumulated in the charge-accumulating section, during a horizontal blanking period, and the charge transferred to the charge-accumulating section is added to the charge accumulated in the charge-accumulating section, during a different horizontal blanking period.

3. An image pickup apparatus according to claim 1, wherein the control circuit controls the unit cells such that the charge-limiting device limits the charge to be accumulated in the charge-accumulating section and the charge transferred to the charge-accumulating section is added to the charge accumulated in the charge-accumulating section, during the same vertical blanking period in all cell units.

4. An image pickup apparatus according to claim 1, wherein the first period is longer than the second period.

5. An image pickup apparatus comprising:

an array of unit cells arranged in rows and columns, each unit cell having a light-receiving device for receiving light and generating an electric charge corresponding to the light, a charge-accumulating section for accumulating the electric charge generated by the light-receiving device, a first transistor

having a first control terminal and connected between the light-receiving device and the charge-accumulating section, for transferring the charge generated in the light-receiving device to the charge-accumulating section when a transfer signal is supplied to the first control terminal, and a second transistor having a second control terminal and connected to the charge-accumulating section, for limiting the charge accumulated in the charge-accumulating section when a voltage between off voltage and on voltage is applied to the second terminal;

a plurality of vertical signal lines extending along the columns of unit cells, respectively, each for receiving a electric data item corresponding to the electric charge accumulated in the charge-accumulating section of any unit cell of the associated column; and

a control circuit for controlling each of the unit cells, causing the second transistor to limit the charge generated by the light-receiving device during a first period and transferred to the charge-accumulating section through the first transistor, and adding, to the electric charge accumulated in the charge-accumulating section, the charge generated by the light-receiving device during a second period following the first period and transferred to the charge-accumulating section through the first transistor.

6. A method of controlling an image pickup

apparatus comprising: an array of unit cells arranged in rows and columns, each unit cell having a light-receiving device for receiving light and generating an electric charge corresponding to the light, a charge-accumulating section for accumulating the electric charge generated by the light-receiving device, a transfer device for transferring the electric charge from the light-receiving device to the charge-accumulating section, and a charge-limiting device for limiting the electric charge accumulated in the charge-accumulating section; a plurality of vertical signal lines extending along the columns of unit cells, respectively, each for receiving a electric data item corresponding to the electric charge accumulated in the charge-accumulating section of any unit cell of the associated column, said method comprising the steps of:

transferring the charge generated by the light-receiving device during a first period to the charge-accumulating section through the transfer device;

limiting the charge transferred to the charge-accumulating section, by means of the charge-limiting device; and

transferring the charge generated by the light-receiving device during a second period following the first period, to the charge-accumulating section through the transfer device, thereby adding the charge generated during the second period to the charge

limited by the charge-limiting device.

7. An image pickup apparatus comprising:

an array of unit cells arranged in rows and columns, each having a light-receiving device for receiving light and generating an electric charge corresponding to the light;

a plurality of vertical signal lines extending along the columns of unit cells, respectively, each for receiving a electric data item corresponding to the electric charge generated by the light-receiving device of any unit cell of the associated column;

a control circuit for controlling each of the unit cells of the same row such that electric data items corresponding to electric charges generated by the light-receiving device during different periods, respectively, are read through the vertical signal line; and

a data-holding circuit for temporarily holding the electric data items read by the control circuit, so as to add the electric data items in an external circuit.

8. An image pickup apparatus according to claim 7, wherein the control circuit controls each of the unit cells of the same row such that the electric data items are read through the vertical signal line during different horizontal blanking periods, respectively.

9. An image pickup apparatus according to claim 7, wherein the different periods differ in length.

10. An image pickup apparatus comprising:

an array of unit cells arranged in rows and columns, each having a light-receiving device for receiving light and generating an electric charge corresponding to the light;

a plurality of vertical signal lines extending along the columns of unit cells, respectively, each for receiving a electric data item corresponding to the electric charge generated by the light-receiving device of any unit cell of the associated column;

a vertical control circuit for controlling the unit cells such that electric data items generated by the unit cells of different rows are read to the vertical signal lines during the same horizontal blanking period, and that electric data items corresponding to electric charges generated by the light-receiving device of each unit cell of the same row during different periods, respectively, are read through the vertical signal lines during different horizontal blanking periods;

a plurality of data-holding circuits for temporarily holding the electric data items read from the unit cells of different rows during the same horizontal blanking period under the control of the vertical control circuit;

a horizontal control circuit for controlling reading of the electric data items from the

data-holding circuits;

a storage circuit for storing the electric data items read from the data-holding circuits under the control of the horizontal control circuit; and

an adder circuit for adding those electric data items stored in the storage circuit, which correspond to the charges generated by the same light-receiving device during different periods.

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